What is claimed is:

1. A signal detection method of searching an input time-series signal for a signal portion similar to a reference time-series signal which is registered in advance and is shorter than the input time-series signal, the method comprising:

a reference feature calculating step of obtaining a reference feature time-series signal from the reference time-series signal, where the reference feature time-series signal consists of feature vectors;

an input feature calculating step of obtaining an input feature time-series signal from the input time-series signal, where the input feature time-series signal consists of feature vectors;

a reference feature coding step of converting the reference feature time-series signal into a reference coded time-series signal consisting of codes which indicate classifications;

an input feature coding step of converting the input feature time-series signal into an input coded time-series signal consisting of codes which indicate classifications;

a distortion adding step of adding a distortion to at least one of the reference time-series signal, the input time-series signal, the reference feature time-series signal, the input feature time-series signal, the reference coded time-series signal, and the input coded time-series signal; and

a histogram collating step of determining a collation portion in the input coded time-series signal, generating histograms of both the reference coded time-series signal and the collation portion of the input coded time-series signal, and calculating a degree of similarity between the reference coded time-series signal and the collation portion based on the generated histograms, and

wherein the degree of similarity is compared with a predetermined target degree of similarity, and the histogram collating step is repeatedly executed while changing the collation portion in the input coded time-series signal, thereby determining whether the reference time-series signal is present in the relevant portion of the input time-series signal.

2. A signal detection method as claimed in claim 1, wherein when the distortion is added to any one of the reference time-series signal and the input time-series signal in the distortion adding step, a plurality of distortions are added to a signal portion corresponding to each time section of said one of the reference time-series signal and the input time-series signal.

3. A signal detection method as claimed in claim 1, wherein when the distortion is added to any one of the reference feature time-series signal and the input feature time-series signal in the distortion adding step, a plurality of distortions are added to each feature vector of said one of the reference feature time-series signal and the input feature time-series signal.

4. A signal detection method as claimed in claim 1, wherein when the distortion is added to any one of the reference coded time-series signal and the input coded time-series signal in the distortion adding step, a plurality of distortions are added to each code of said one of the reference coded time-series signal and the input coded time-series signal.

5. A signal detection method as claimed in claim 1, further comprising:

a learning step of calculating, in advance, an amount of distortion used for distorting features in the distortion adding step, and

wherein in the distortion adding step, the distortion is added based on the amount of distortion calculated in the learning step.

6. A signal detection method as claimed in claim 5, wherein the amount of distortion calculated in the learning step is corrected based on a detected result indicating whether the reference time-series signal is present in the relevant portion of the input time-series signal.

7. A signal detection method as claimed in claim 1, wherein in the distortion adding step, the added distortion is generated using random numbers.

8. A signal detection method as claimed in any one of claims 5 and 7, wherein in the distortion adding step:

an amount of distortion used for distorting features is modeled using a normal distribution, wherein parameters in the modeling are the amount of parallel translation and the variance; and

the distortion is added using at least one of the amount of parallel translation and the variance.

9. A signal detection method as claimed in claim 1, wherein the input time-series signal and the reference time-series signal are each picture signals.

10. A signal detection method as claimed in claim 1, wherein the input time-series

signal and the reference time-series signal are each audio signals.

11. A signal detection apparatus for searching an input time-series signal for a signal portion similar to a reference time-series signal which is registered in advance and is shorter than the input time-series signal, the apparatus comprising:

a reference feature calculating section for obtaining a reference feature time-series signal from the reference time-series signal, where the reference feature time-series signal consists of feature vectors;

an input feature calculating section for obtaining an input feature time-series signal from the input time-series signal, where the input feature time-series signal consists of feature vectors;

a reference feature coding section for converting the reference feature time-series signal into a reference coded time-series signal consisting of codes which indicate classifications;

an input feature coding section for converting the input feature time-series signal into an input coded time-series signal consisting of codes which indicate classifications;

a distortion adding section for adding a distortion to at least one of the reference time-series signal, the input time-series signal, the reference feature time-series signal, the input feature time-series signal, the reference coded time-series signal, and the input coded time-series signal; and

a histogram collating section for determining a collation portion in the input coded time-series signal, generating histograms of both the reference coded time-series signal and the collation portion of the input coded time-series signal, and calculating a degree of similarity between the reference coded time-series signal and the collation

portion based on the generated histograms, and

wherein the histogram collating section determines different collation portions in the input coded time-series signal in turn, calculates the degree of similarity for each collation portion, compares the calculated degree of similarity with a predetermined target degree of similarity, and repeatedly executes the comparison for each determined collation portion, thereby determining whether the reference time-series signal is present in the relevant portion of the input time-series signal.

12. A signal detection apparatus as claimed in claim 11, wherein when the distortion is added to any one of the reference time-series signal and the input time-series signal, the distortion adding section adds a plurality of distortions to a signal portion corresponding to each time section of said one of the reference time-series signal and the input time-series signal.

13. A signal detection apparatus as claimed in claim 11, wherein when the distortion is added to any one of the reference feature time-series signal and the input feature time-series signal, the distortion adding section adds a plurality of distortions to each feature vector of said one of the reference feature time-series signal and the input feature time-series signal.

14. A signal detection apparatus as claimed in claim 11, wherein when the distortion is added to any one of the reference coded time-series signal and the input coded time-series signal, the distortion adding section adds a plurality of distortions to each code of said one of the reference coded time-series signal and the input coded time-series signal.

15. A signal detection apparatus as claimed in claim 11, further comprising:

a learning section for calculating, in advance, an amount of distortion used for distorting features when adding the distortion, and

wherein the distortion adding section adds the distortion based on the amount of distortion calculated by the learning section.

16. A signal detection apparatus as claimed in claim 15, wherein:

feedback of a detected result, determined by the histogram collating section, indicating whether the reference time-series signal is present in the relevant portion of the input time-series signal, is input into the learning section; and

the learning section corrects the amount of distortion based on the detected result.

17. A signal detection apparatus as claimed in claim 11, wherein the distortion adding section adds the distortion by using random numbers.

18. A signal detection apparatus as claimed in any one of claims 15 and 17, wherein:

the distortion adding section models an amount of distortion by using a normal distribution, wherein the amount of distortion is used for distorting features, and parameters in the modeling are the amount of parallel translation and the variance; and

the distortion adding section adds the distortion using at least one of the amount of parallel translation and the variance.

19. A signal detection apparatus as claimed in claim 11, wherein the input time-series signal and the reference time-series signal are each picture signals.

20. A signal detection apparatus as claimed in claim 11, wherein the input time-series signal and the reference time-series signal are each audio signals.

21. A program for making a computer execute a signal detecting operation of searching an input time-series signal for a signal portion similar to a reference time-series signal which is registered in advance and is shorter than the input time-series signal, the operation comprising:

a reference feature calculating step of obtaining a reference feature time-series signal from the reference time-series signal, where the reference feature time-series signal consists of feature vectors;

an input feature calculating step of obtaining an input feature time-series signal from the input time-series signal, where the input feature time-series signal consists of feature vectors;

a reference feature coding step of converting the reference feature time-series signal into a reference coded time-series signal consisting of codes which indicate classifications;

an input feature coding step of converting the input feature time-series signal into an input coded time-series signal consisting of codes which indicate classifications;

a distortion adding step of adding a distortion to at least one of the reference time-series signal, the input time-series signal, the reference feature time-series signal, the input feature time-series signal, the reference coded time-series signal, and the input coded time-series signal; and

a histogram collating step of determining a collation portion in the input coded time-series signal, generating histograms of both the reference coded time-series signal and the collation portion of the input coded time-series signal, and calculating a degree of similarity between the reference coded time-series signal and the collation portion based on the generated histograms, and

wherein the degree of similarity is compared with a predetermined target degree of similarity, and the histogram collating step is repeatedly executed while changing the collation portion in the input coded time-series signal, thereby determining whether the reference time-series signal is present in the relevant portion of the input time-series signal.

22. A computer readable storage medium storing a program as claimed in claim 21.